

Job Performance at Risk

On June 8, 2022, at 11:28 am central time, a Natural Gas Facility in Quintana, Texas experienced a Boiling Liquid Expanding Vapor Explosion (“BLEVE”) when the temperature in a line rose above the critical temperature of 107.3°F and pressure grew to greater than 717 pounds per square inch gauge (psig). The BLEVE resulted in the catastrophic failure of the line. which was immediately followed by a deflagration (vapor cloud explosion), a fireball, a small secondary pool fire, and a short-term release of vaporizing LNG from damaged 3-inch piping. This explosion and resulting fire caused significant damage to the aforementioned 3-inch piping, to other process piping, instrumentation, wiring, and pipe rack structures as well as additional process equipment and associated piping in adjacent areas within and near the pipe rack. ¹ It was not until November 9, 2022, that the Facility was allowed to begin *partial* operations in accordance with the Facility’s PHMSA approved HAZOP plan.

In a combined PHMSA/Federal Energy Regulatory Commission (FERC)/United States Coast Guard (USCG) Information Session, Operator fatigue was cited as a probable contributing factor to the incident. There were, of course, other contributing causes cited, such as inadequate valve testing procedures and alarm fatigue.

In this particular case, Operator fatigue from understaffing played a role. Operators at this Facility, like in most pipeline facilities across the North Americas, generally worked 12-hour shifts. At this Facility, however, nearly three-fourths of the Operators had worked at least 20% more than their scheduled hours in the first half of 2022 due to staffing inadequacies.

Excessive overtime, inadequate quality and quantity of sleep during off-duty hours, and family and other personal stressors all contribute to fatigue. When fatigue strikes, the most effective countermeasure is sleep. Incidents like the one noted in this article are exactly why there are regulated maximum Controller hours of service limits and rules specifying that Controller work schedule must be designed to provide Controllers with off-duty time sufficient to achieve eight hours of continuous sleep between shifts. These responsibilities belong to the Company.

But managing fatigue is a shared responsibility that involves both the Company and the Controller. Controller responsibilities include managing one’s health, managing off-duty hours by using free time between shifts wisely to get as much sleep as possible, living a reasonable distance from the workplace if practical, and scheduling personal activities around dedicated sleep time for off-duty days.

When quantifying fatigue to ensure Controller fatigue levels as it relates to the ability to safely and effectively perform on duty, we recommend using a Fatigue Observations Checklist or a Fatigue Assessment Form. With most of these checklists, a high fatigue score indicates significant fatigue which might include fighting sleep, slurred speech, staring, microsleeps and head nods. A Controller Fatigue Self-Reporting Form is also a great tool to help bring self-awareness to a fatigued Controller. Fatigue Self-Reporting Forms also help document the fatigue scenario for the Company which can identify problems in staffing schedules or chronic Controller fatigue issues. Supervisors must always be immediately informed when there is a concern of a fatigued Controller.

Controller alertness is imperative to safe operations in the safety-critical pipeline environment. Take the proper precautions and be aware of the fatigue hazards so that job performance and safety risk are minimized!



¹ IFO Group (2022), June 8, 2022 – Loss of Primary Containment Incident Investigation Report, <https://www.energy.gov/sites/default/files/2023-11/Attachment%208.pdf>